

BRIDGE ACROSS THE HUDSON RIVER, BETWEEN STORM-KING AND BREAKNECK MOUNTAINS, IN THE STATE OF NEW YORK.

MARCH 18, 1884.—Referred to the House Calendar and ordered to be printed.

Mr. SEYMOUR, from the Committee on Commerce, submitted the following

REPORT:

[To accompany bill H. R. 6079.]

The Committee on Commerce, to which was referred the bill (H. R. 2426) to authorize the construction of a bridge across the Hudson River, between Storm-King and Breakneck Mountains, in the State of New York, having had the same under consideration, begs leave to report as follows:

That the bridge sought to be authorized under this bill is intended to connect the New York, Lake Erie and Western Railroad; the Western and Ontario; the New York, West Shore and Buffalo; and the Lehigh and Hudson Railroad (all of which four roads converge, and have a tide-water terminus on the west bank of the Hudson River at or near Cornwall), with the New York and New England road, which has its terminus on the east bank of the river, almost immediately opposite. Transfer of cars is at present made by means of a float-ferry, which, in view of ice obstructions in winter, and other impediments, is uncertain, unsatisfactory, and quite inadequate to the traffic, yet in its infancy.

The objection to the passage of this bill, upon the hearing before the committee, came from representatives of the tow-line companies of the Hudson River. It was claimed by them that the currents and winds at the point in question were of a character to render navigation between piers 650 feet apart dangerous. Colonel Newton, however, advises your committee, as will appear from his letter hereto annexed, that "at the locality proposed for the bridge the currents are quite moderate in strength, and it is probable that their directions are also favorable." Other evidence from civil engineers, river pilots, and persons conversant with the river confirms such opinion.

The channel of the Upper Hudson, through which the tow-lines pass, is only about 150 feet in width, against 650 feet between the piers of proposed bridge. The depth of water under the proposed bridge is favorable, varying from 30 to 80 feet.

The committee having adopted the suggestions of the engineers to whom the bill was referred, and of the Secretary of War, and having prepared a carefully guarded substitute, which provides, among other things, for the oversight by the Secretary of War of the progress of its construction, is satisfied that the navigation of the Hudson River will not be substantially interfered with. It therefore reports adversely upon the bill (H. R. 2426) which was referred to it, and recommends the passage of the accompanying substitute.

The annexed exhibits are the letters of the Secretary of War, of Colonel of Engineers Newton, and of James Willis, civil engineer, with accompanying maps.

A.

WAR DEPARTMENT,
Washington City, February 8, 1884.

SIR: Acknowledging the receipt of letter of the 19th ultimo from the clerk of the Committee on Commerce, House of Representatives, inclosing two copies of bill H. R. 2426, "A bill to authorize the construction of a bridge across the Hudson River, between Storm-King and Breakneck Mountains, in the State of New York," and requesting that you be furnished with the views of this Department thereon, I have the honor to inclose herewith a copy of a report of the 1st instant from Col. John Newton, Corps of Engineers, to whom the subject was referred, from which it will be seen that he proposes certain amendments to the bill, which he considers necessary to the protection of navigation.

The views and recommendations of Colonel Newton are concurred in by the Chief of Engineers and by this Department, and it is suggested that the bill be amended accordingly.

Very respectfully, your obedient servant,

ROBERT T. LINCOLN,
Secretary of War.

Hon. E. W. SEYMOUR,
Of the Committee on Commerce, House of Representatives.

B.

UNITED STATES ENGINEER OFFICE,
New York, February 1, 1884.

GENERAL: I have the honor to report concerning bill H. R. 2426, "to authorize the construction of a bridge across the Hudson River between Storm-King and Breakneck Mountains, in the State of New York."

Section 4 imposes certain dimensions and other conditions upon the construction of the bridge, as follows: "That the said bridge shall be built at an elevation over the channel of at least 140 feet in the clear above high water of spring tides, and the piers shall be parallel with the current of the river, with spring fenders, and shall be shaped on the up-stream ends so as to break the ice, and shall be placed at a distance from each other of not less than 650 feet."

The first requirement to be satisfied refers to the height of the bridge in the clear above the high waters of the spring tides; ships of 1,100 to 1,200 tons would require a height of about 170 feet above water to clear everything. The royal and top-gallant masts being generally in one stick, it would be necessary for vessels of that tonnage, when a deficiency of height existed under the bridge, to send down a spar of about 50 feet in length.

The height of 140 feet specified in the bill would probably answer for all vessels under 600 tons, but for those above that tonnage it would be necessary to let down the upper spars in order to pass.

Three-masted schooners of 400 to 500 tons require a clear height of about 130 feet, and information comes from the Cheney Towing Line that brigs and schooners, mostly three-masted, are towed above the locality selected for the bridge, and that many of these are of 1,000 tons.

The indications, therefore, are that for convenience to navigation the height of the bridge in the clear should be increased to not less than 160 feet above high water of spring tides.

I recommend that the following clause of section 4, viz, "and shall be shaped on the up-stream ends so as to break the ice," be modified so as to read "and shall be shaped so as to break the ice," because, although not likely, it is possible that arrangements to break the ice might be required on the lower as well on the upper ends of the piers—it being borne in mind that this is a tidal river. The necessity for ice-breakers, whether upon both ends of the piers or upon the upper end only, could be afterwards settled, when, under section 6, the plan and specifications, with the necessary drawings of the bridge, should have been submitted to the Secretary of War for his action.

At the same time the position of the piers with respect to the directions of the current would be finally settled, as, from the general want of coincidence of the ebb and flood currents, it is not possible that "the piers shall be parallel with the current of the river," that is, strictly parallel.

In the final examination, also, the direction and action of high winds, as to their effect in conjunction with the piers upon navigation, should be considered.

At the locality proposed for the bridge the currents are quite moderate in strength, and it is probable that their directions also are favorable.

With the amendments proposed, and the examination under section 6, including the

power of refusal to authorize the commencement of the bridge, it is not perceived that any detriment to commerce and navigation would be incurred by the passage of the bill.

Respectfully submitted.

JOHN NEWTON,
Colonel of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, Washington, D. C.

C.

COUNTY OF ORANGE, ss:

JAMES WILLIS and WILLIAM FOGERTY, being each duly sworn, say, and each for himself says, that he is a civil engineer and surveyor, and resides in the town of Cornwall, N. Y.; that he made the examination of the tides and currents on the Hudson River at the point of the proposed bridge of the Highland Trans-Hudson Railroad Company at Storm King, and for at least a mile on either side, and also took the names of tug-boats as far as possible, the length of tows and number of tow-boats composing the tows, and a record of the dates on which they passed the site of the proposed bridge and a point one mile on either side, all of which examinations are correctly set forth in the annexed maps and statement, and that the same are true in every respect.

JAMES WILLIS, C. E.
WM. FOGERTY, JR.

Subscribed and sworn to before me this 4th day of January, 1884.

D. E. SUTHERLAND,
Notary Public, Orange County.

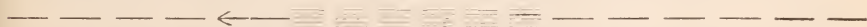
Report of a survey of the Hudson River between Storm King Mountain, at Cornwall, on the west, and Breakneck Mountain, on the east, together with observations on the tidal and atmospheric currents, as well as the passage of tows over the site of the proposed bridge over the Hudson at Cornwall.

On Thursday the 22d day of November last, we proceeded to take soundings and anchor buoys as shown on maps accompanying this report, for the purpose of determining the relative position of passing tows and otherwise, which is laid down on a series of five maps, marked respectively Map No. 1, Map No. 2, &c. Each of these maps have their general lines the same, that is, the outline of the river, the north line of buoys, extending from the line opening in the range of Storm King and the west end of the hotel on West Point to Pallopel's Island, marked *a, b, c, d, e*, with the depth of water at each, the line of buoys at the site of the proposed bridge and the south line between Sherwood's Rock and Little Stony Point. These are the general lines referred to.

The buoys being placed, we next proceed to ascertain the current of the tide by putting floats overboard at the buoys in pairs marked in consecutive order, which are represented on the maps in red dotted lines, at the same time noting the passing tows and all particulars relating thereto, and for the better understanding of the matter the maps are intended to be read in consecutive order, with the descriptions herein written.

Map No. 1 shows the courses of four tows, numbered in their order of passing, thus

1



represents the tow-boat McDonald going south with six tiers of boats, occupying a space of about 1,000 feet in length, as near as the eye could judge, passing at 10.30 a. m., with a slack tide and southwest wind, force 6.

2. Ontario, going north, with three tiers of boats, covering a space of about 800 feet, passing at 11.40 a. m., with a tide setting northwardly and a southwest wind as above.

3. Vanderbilt, going north, with five tiers of boats, covering a space of about 1,100 feet, passing at 11.50 a. m.; tide and wind as Ontario.

4. Name unknown, going north, with three tiers of boats, covering a space of about 600 feet; passing at 2.30 p. m.; wind and tide as above.

The floats on this occasion were put over too late on tide, and did not float through, but on the turn of the tide floated back, and most of them were lost. Some were picked up the next day floating in the center of the river. I looked along on each side of the river to see if any had washed on shore, but found none, one proof of the current being central.

Map No. 2.—There were nine pairs of floats on this map, put over at the north line, and are represented both by black and red dotted lines; 1 to 4 drifted westwardly,

but went through to the south line with the remainder, except 9, which probably was caught in the eddy in the wake of the island.

This map shows the courses of five tows.

1. Syracuse, going north, with seven tiers of boats, covering a space of about 1,200 feet; passing at 8 a. m.; tide, setting southwardly; wind, varying from NW. to NE.; force, 7 to 8.

2. Name unknown, going south, with ice boats; four tiers; covering a space of 700 feet; passing at 8.30; wind and tide as above.

3. Cayuga, going north, with six tiers of boats, covering a space of about 1,100 feet; passing about 9.35 a. m.; wind and tide as above.

4. Oswego, going north, with five tiers of boats, covering a space of about 1,100 feet; passing at 11.20 a. m.; tide, setting southerly; wind, NNW.; force, 4.

5. Austin, going north, with four tiers, covering a space of about 1,000 feet; passing at 1.30 p. m.; tide, southerly; wind, NNW.; force, 3.

Map No. 3.—There were five pairs of floats put over between Sherwood's Rock and Little Stony Point. Watched them through, as shown on map.

This map shows the courses of six tows.

1. America, with assistant, going south, with eleven tiers of boats, covering a space of about 1,800 feet; passing at 2.40 p. m.; tide setting southerly; wind, NW.; force, 2.

2. Name unknown, with assistant, going north, with six tiers of boats, covering a space of 1,100 feet; passing at 8.45 a. m.; tide, high water, with no wind.

3. Name unknown, propeller, going north, with three tiers of boats, covering a space of about 800 feet; passing at 9.15 a. m.; tide, slack, with no wind.

4. Name unknown, going north, with four tiers of boats, covering a space of about 800 feet; passing at 10.45 a. m.; tide, setting S. by W., with no wind.

5. Oswego, going south, with seven tiers of boats, covering a space of about 1,500 feet; passing at 11 a. m.; tide, setting southwesterly; wind, 0.

6. Vanderbilt, going south, with ten tiers of boats, covering a space of about 1,700 feet; passing at 3 p. m.; tide, slack; wind, 0.

Map No. 4.—Put out floats on south line by Sherwood's Rock, but could not collect them on account of hard winds from north-northeast. Was obliged to leave the boat for the night in the bay below Storm King and walk home. On the same map are represented floats put out the next day, which float through as there shown.

This map shows the courses of seven tows.

1. America, going north, with five tiers of boats, covering a space of 1,100 feet; passing at 8.45 a. m.; tide, setting N.; wind, N.; force, 4.

2. Name unknown, going north, with three tiers of boats, covering a space of about 600 feet; passing at 9.10 a. m.; tide and wind as above.

3. Name unknown, with assistants, going north, with four tiers of boats, covering a space of about 1,000 feet; passing at 9.15 a. m.; wind, N.; tide, northerly.

4. Washburn, propeller, going south, with three tiers, covering a space of about 800 feet; passing at 10 a. m.; wind, N.; force, 3; tide, slack.

5. McDonald, with assistant, going south, with eight tiers of boats, covering a space of 1,200 feet; passing at 10.20 a. m.; wind, NNE.; force, 4; tide, slack.

6. Name unknown, going north, with three tiers of boats, covering a space of about 700 feet; passing at 10.30; wind and tide as above.

7. Name unknown, propeller, going south, with three tiers of boats, five of which carried hay and straw; covering a space of 600 feet; passing at 10.30 a. m.; wind and tide as above.

Map No. 5.—Floats put over on the north line and floated through, indicating an ebb-tide, running about $2\frac{1}{2}$ miles per hour.

There are nine tows shown on this map.

1. Three propellers, names unknown, going north, with four tiers of boats, covering a space of about 700 feet; passing at 10.25 a. m.; wind, NNE.; force, 3; tide, slack.

2. Propeller, name unknown, going north, with three tiers, covering a space of about 600 feet; passing at 11 a. m.; wind, NNE.; force, 3; tide, southerly.

3. Propeller, unknown, going south, with four tiers, covering a space of about 900 feet; passing at 11.10 a. m.; wind and tide as above.

4. Unknown, with two schooners alongside, going north, with four tiers of boats; passing at 2 p. m.; wind, NNE.; force, 3; tide, setting southerly.

5. Syracuse, with assistant, going south, with eleven tiers of boats, covering a space of about 1,700 feet; passing at 3 p. m.; wind and tide as above.

6. Propeller, unknown, going north, with three tiers, covering a space of about 500 feet; passing at 7.40 a. m.; wind, NNE.; force, 4.

7. Oswego, going south, with nine tiers of boats, covering a space of 1,700 feet; passing at 8 a. m.

8. Two propellers, going south, with two tiers, covering a space of about 500 feet; passing at 1.40 p. m.

9. Connecticut, going south, with ten tiers of boats, covering a space of 1,800 feet; passing at 3.10 p. m.; wind, northerly, 3.

Notes of tows, tides, winds, &c.

Date.	Wind.	Force.	Name of tow-boat, when known.	Going north or south.	Number of tiers.	Approximate length of tow.	Time of passing.			Course or set of tides.	Direction of line of tows.	Remarks.
							Pol. Island.	Bridge site.	Stony Point.			
Nov. 22	SW.	6	McDonald	S	6	<i>Feet.</i> 1,000	10.30 a	.....	.....	Slack.	Straight through	
Nov. 22	SW.	6 to 5	Ontario	N.	3	800	11.40 c	.....	.....	N.W.	do	
Nov. 22	SW.	5	Vanderbilt	N.	3	1,000	12.00 a	11.50 b c	.....	NNW.	do	
Nov. 22	SW.	5	Name unknown	N.	3	500	2.30	.....	.....	NNW.	do	
Nov. 23	N.Y. var.	7 to 8	Syracuse	N.	7	1,200	8.10 a b	8.00 b c	.....	Sly.	do	
Nov. 23	N.Y. var.	7 to 8	Unknown	N.	4	700	8.30 a	.....	.....	Sly.	do	
Nov. 23	N.Y. var.	4	Cayuga	N.	1	1,000	9.45 b	9.35 b c	.....	Sly.	do	
Nov. 23	N.Y. var.	4	Oswego	N.	5	1,100	11.30 b	11.20 c	.....	Sly.	do	
Nov. 23	N.Y. var.	3	Austin	N.	4	1,000	1.45 c	1.30 c	.....	Sly.	do	
Nov. 23	N.Y. var.	3	America, with assistant.	S.	11	1,800	2.40 b	2.50 c	3.00 c	H. W.	do	
Nov. 24	Calm.	3	Two unknowns	N.	6	1,100	9.15 a	9.30 b c	8.45 c	H. W.	do	
Nov. 24	Calm.	3	Propeller, unknown	N.	3	800	9.40 a b	9.30 b c	9.15 c	S. by N.	do	
Nov. 24	Calm.	3	Unknown	N.	4	800	10.50 c	10.45 b c	.....	S. by N.	do	
Nov. 24	Calm.	3	Oswego	S	7	1,500	3.00 a b	3.10 b	3.25 c	Slack.	do	
Nov. 24	Calm.	2	Vanderbilt	S	10	1,700	9.00 a b	8.45 c	.....	do	do	
Nov. 25	N.	4	America	N.	3	600	9.10 c	.....	.....	do	do	
Nov. 25	N.	4	Unknown, with assistants	N.	3	1,000	9.15 b c	9.00 b c	8.45 c	Nly.	do	
Nov. 25	N.	3	Propeller, Washburn	N.	4	800	9.50 a	.....	.....	Slack.	do	
Nov. 25	NNE.	4	McDonald, assistant	S	8	1,200	10.00 c	10.15 b c	10.30 c	Slack.	do	
Nov. 25	NNE.	4	Unknown	N.	3	700	10.30 a b	10.25 b	10.15 c	Slack.	do	
Nov. 25	NNE.	4	Propeller, unknown	S	3	600	10.15 a b	10.25 c	.....	do	do	Loaded with hay and straw.
Nov. 25	NNE.	3	Three propellers, unknown	N.	4	700	10.40 a	10.25 b	.....	Slack.	do	
Nov. 25	NNE.	3	Propeller, unknown	N.	3	600	11.15 a	11.00 a	.....	Sly.	do	
Nov. 25	NNE.	3	do	N.	4	900	11.00 a	11.10 b c	.....	SWly.	do	
Nov. 25	NNE.	3	Unknown, with two schooners alongside.	N.	4	900	2.20 b c	2.00 c	1.45 c	SWly.	do	
Nov. 25	NNE.	3	Syracuse, with assistant	N.	11	1,700	2.45 a	3.00 b c	3.10 c	SWly.	do	
Nov. 27	NNE.	4	Propeller, unknown	N.	3	500	7.40 b	.....	.....	do	do	
Nov. 27	NNE.	5	Oswego	N.	9	1,700	8.00 b	.....	.....	do	do	
Nov. 27	NNE.	6	Two propellers, unknown	S	2	500	.....	1.40	1.50 c d	do	do	
Nov. 27	NNE.	7	Connecticut	S	10	1,800	2.50 a b	3.00 c	3.10 c d	do	do	Moored boat for the night.
Nov. 28	.....	.....	Propeller, unknown	S	5	900	.....	.....	2.00 c	.....	.....
Nov. 28	.....	.....	Paddle, unknown, two schooners alongside	N.	4	800	.....	.....	.....	.....	.....
Nov. 29	.....	.....	Attending to floats all day	.....	.....	.....	.....	.....	.....	.....	.....
Nov. 30	.....	.....	Examining shores for lost floats, found none	.....	.....	.....	.....	.....	.....	.....	.....

